Extreme Rainfall Detection System (ERDS)

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OUTLINE

1. ITHACA overview
2. ERDS Aim and Datasets
3. ERDS live demo
4. Case studies
5. ERDS operational applications

1. ITHACA Overview

ITHACA

INFORMATION TECHNOLOGY FOR HUMANITARIAN ASSISTANCE, COOPERATION AND ACTION

Non-profit association

POLITECNICO DI TORINO 1859 1906

Higher Institute on Territorial Systems for Innovation

MISSION AND COMPETENCES

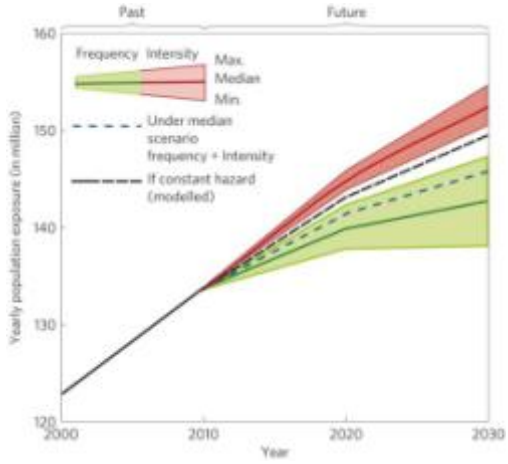
Provide scientific analysis and services to the WFP and the broader humanitarian community in support of environmental emergencies for disaster preparedness and response

1. remote sensing
2. hydrology
3. meteorology
4. cartography
5. GIS

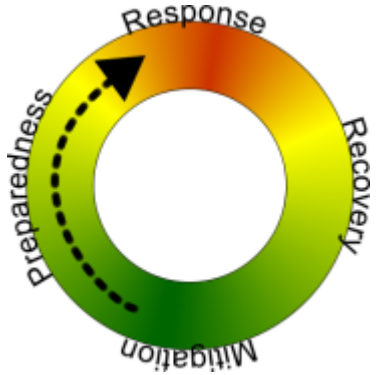
2. ERDS Aim and Datasets

THE CONTEXT

Meteorological hazards are **increasing in frequency and in damage potential**



Monitoring and forecasting of severe weather events allow more effective emergency **preparedness and response**



Early Warning Systems are not often **publicly available** especially **in developing countries**

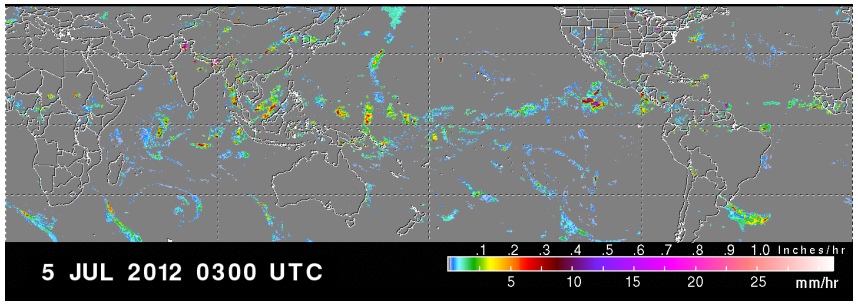
ERDS – Extreme Rainfall Detection System

The **Extreme Rainfall Detection System (ERDS)** is a service aimed at providing **timely** and **easy to understand alerts** related to **exceptional rainfalls** and **potential flood events** at global scale.

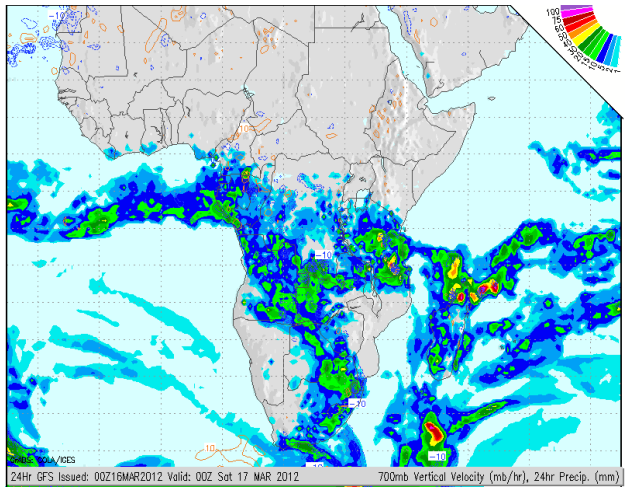
INPUT DATA

OPEN SOURCE DATA

1. Tropical Rainfall Measuring Mission (TRMM) Multisatellite Precipitation Analysis (TMPA) necessary for the **near-real time detection** of heavy rainfall (0.25° spatial resolution)



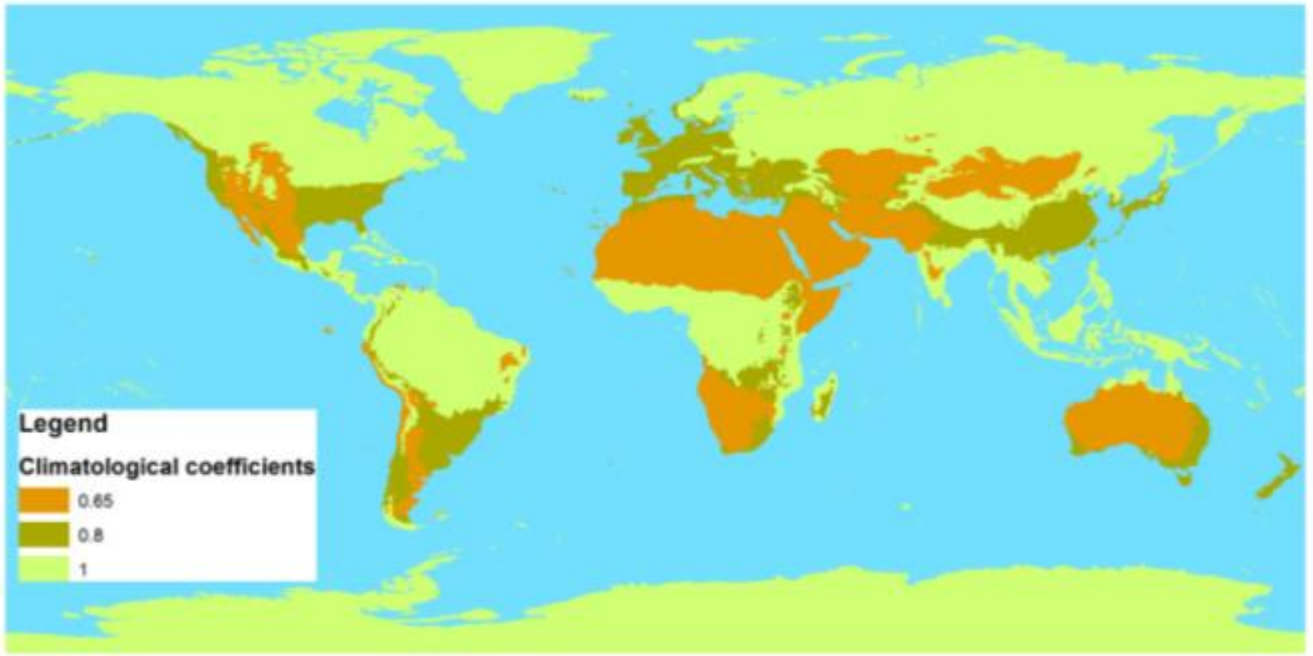
2. NOAA-GFS (Global Forecast System) deterministic model necessary for **forecasted precipitation alerts** (0.5° spatial resolution)



ELABORATION

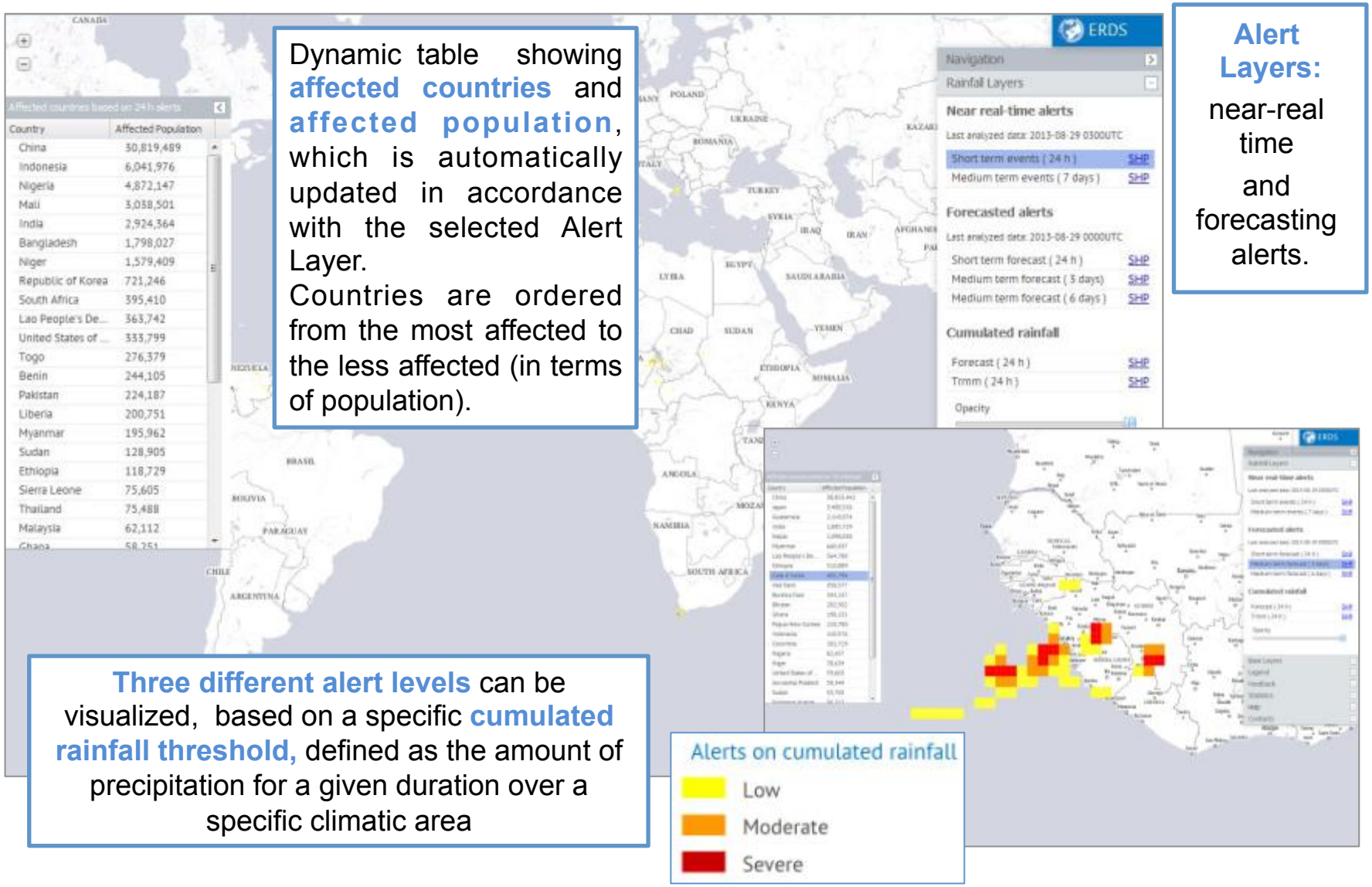
Automatic procedure for the:

1. calculation of **accumulated rainfall**
2. correction of **rainfall thresholds** with **climatological coefficients**
3. identification of **alerts** using climatological rainfall thresholds
4. dissemination of alerts through an **open-source WebGIS** application



OUTPUTS

http://erds2.ithacaweb.org/



Dynamic table showing **affected countries** and **affected population**, which is automatically updated in accordance with the selected Alert Layer.
Countries are ordered from the most affected to the less affected (in terms of population).

Alert Layers:
near-real time
and
forecasting alerts.

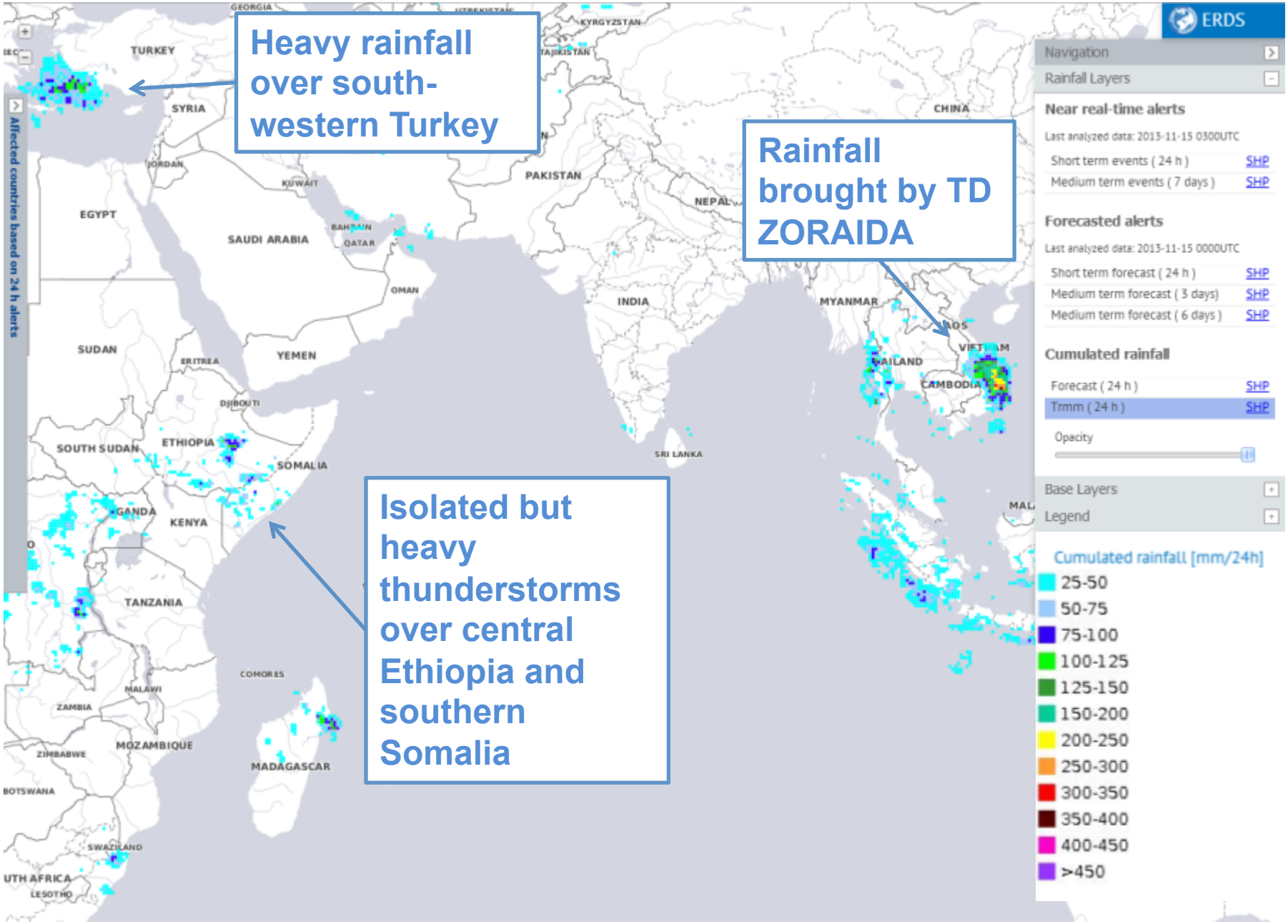
Three different alert levels can be visualized, based on a specific **cumulated rainfall threshold,** defined as the amount of precipitation for a given duration over a specific climatic area

3. ERDS Live demo

ERDS application:
http://erds2.ithacaweb.org/

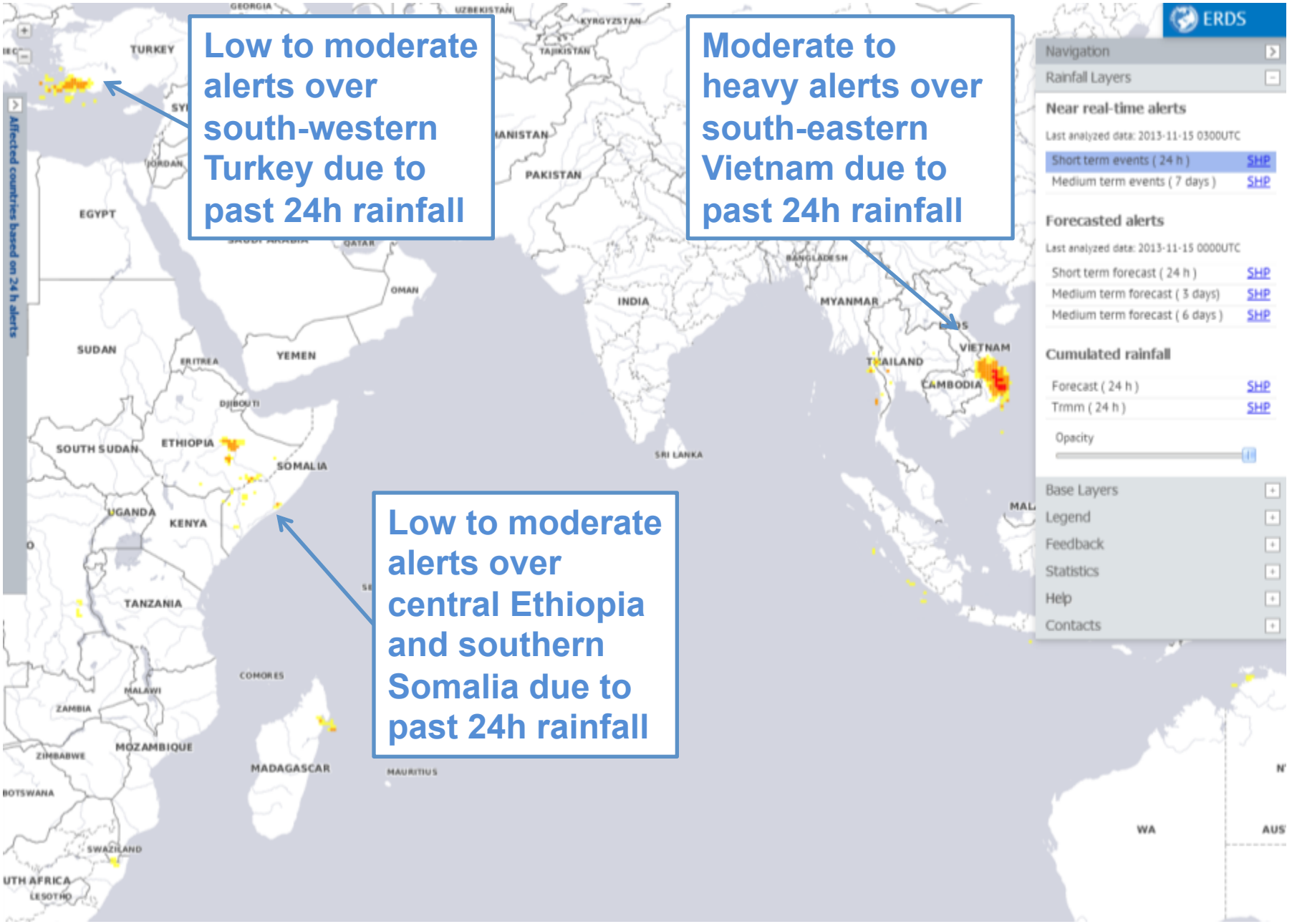
ERDS AS OF 15/11/2013

TRMM 24h accumulated rainfall



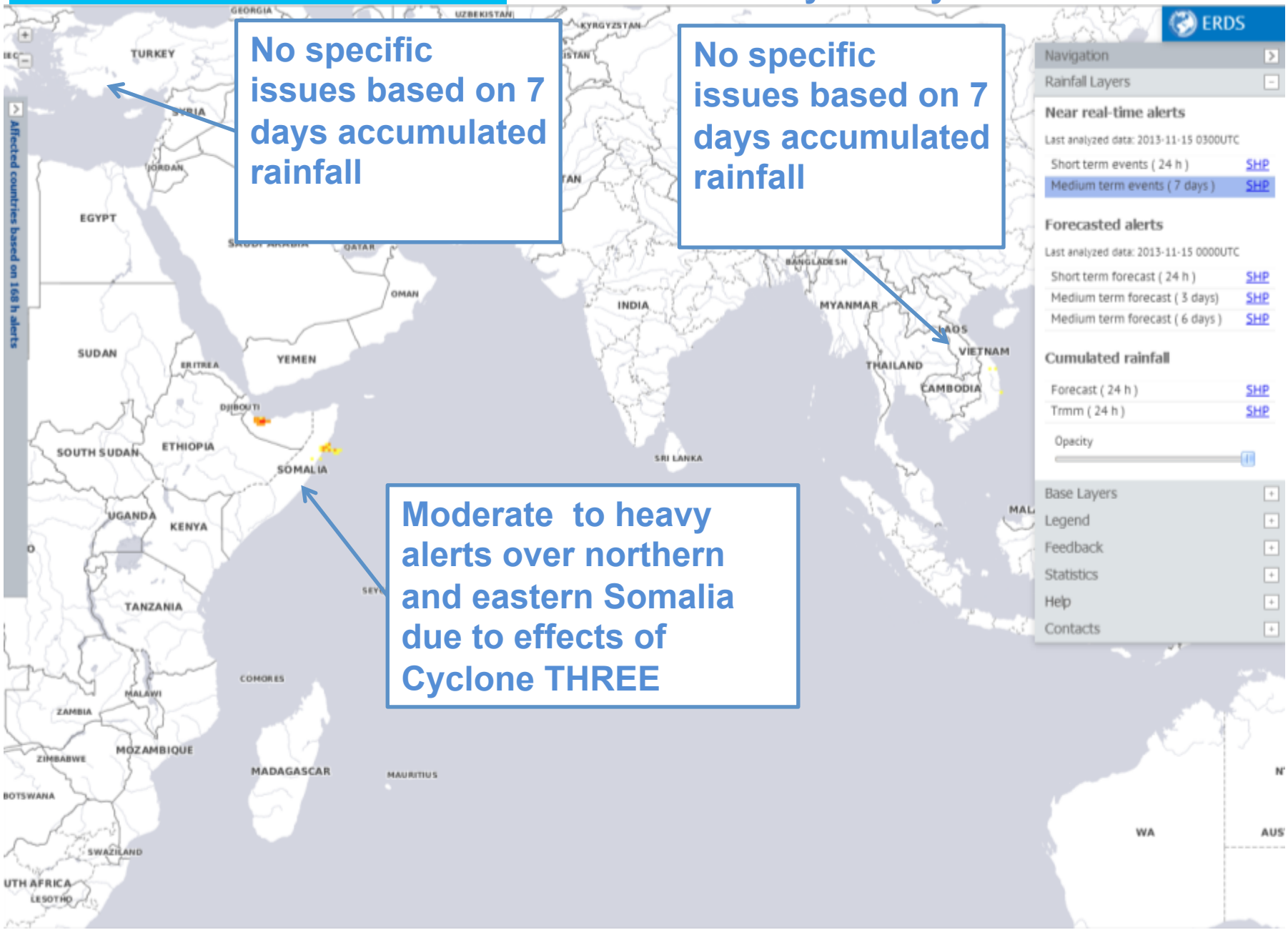
ERDS AS OF 15/11/2013

TRMM 24h heavy rainfall alerts



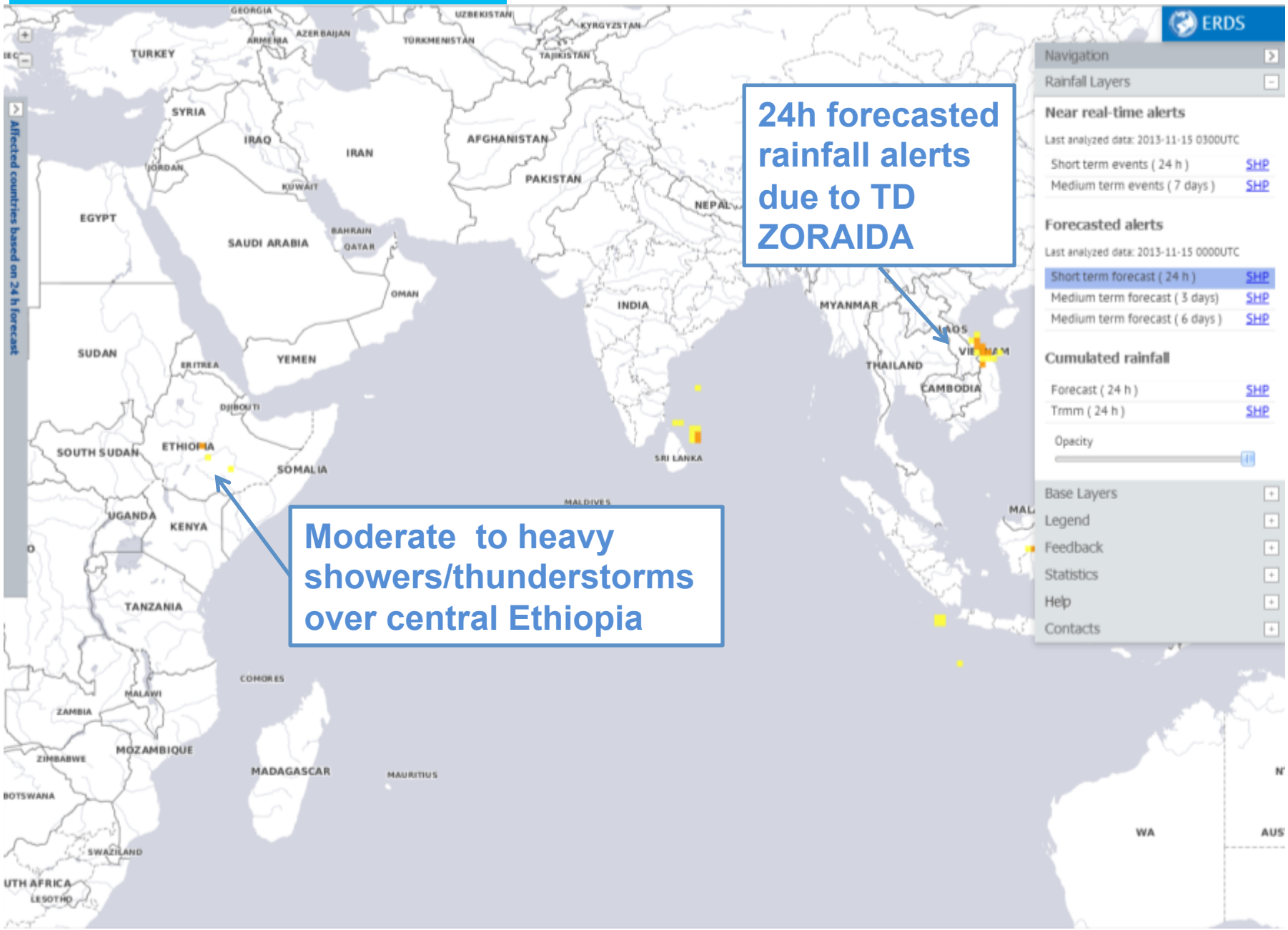
ERDS AS OF 15/11/2013

TRMM 7 days heavy rainfall alerts



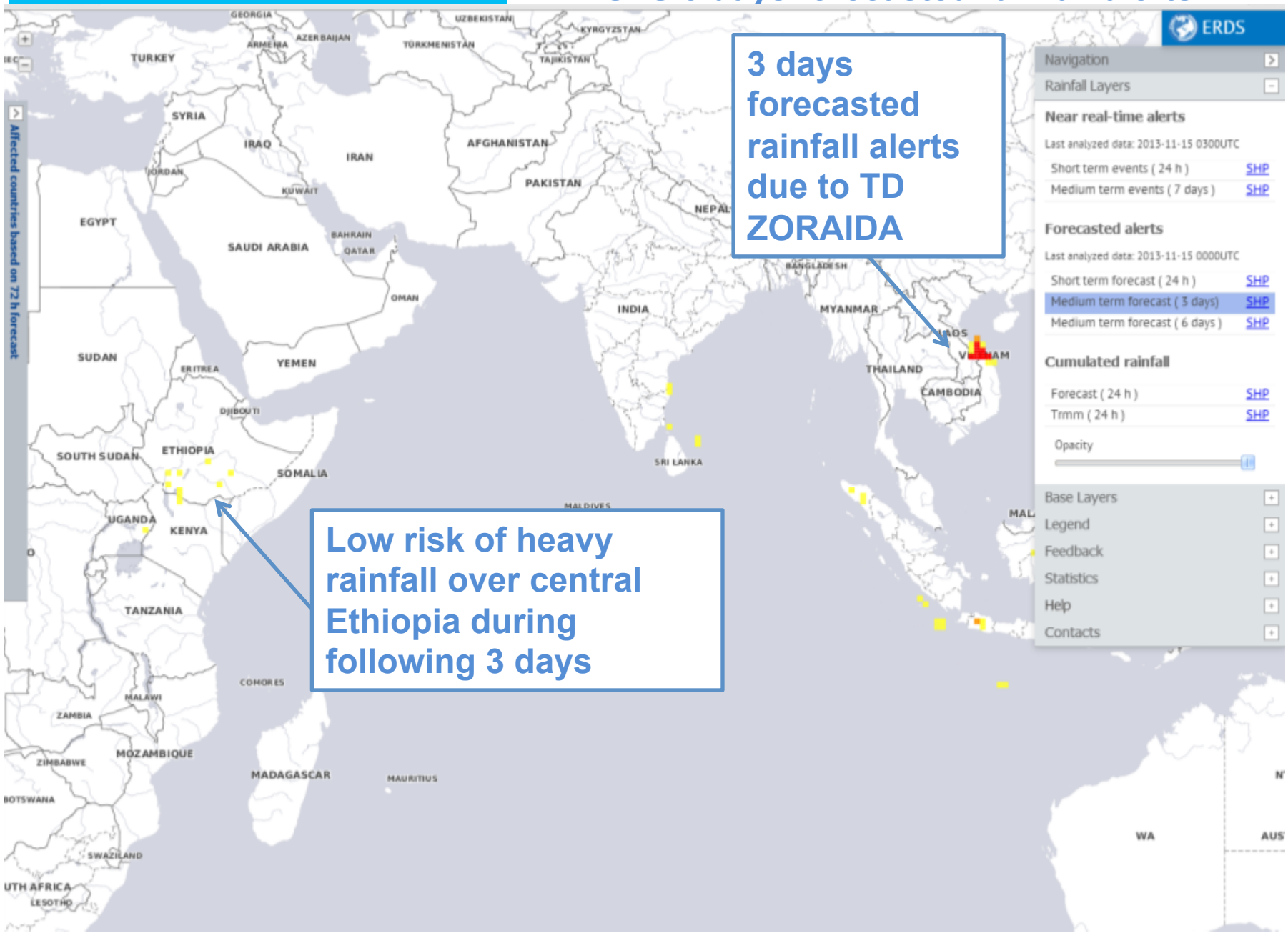
ERDS AS OF 15/11/2013

GFS 24h forecasted rainfall alerts



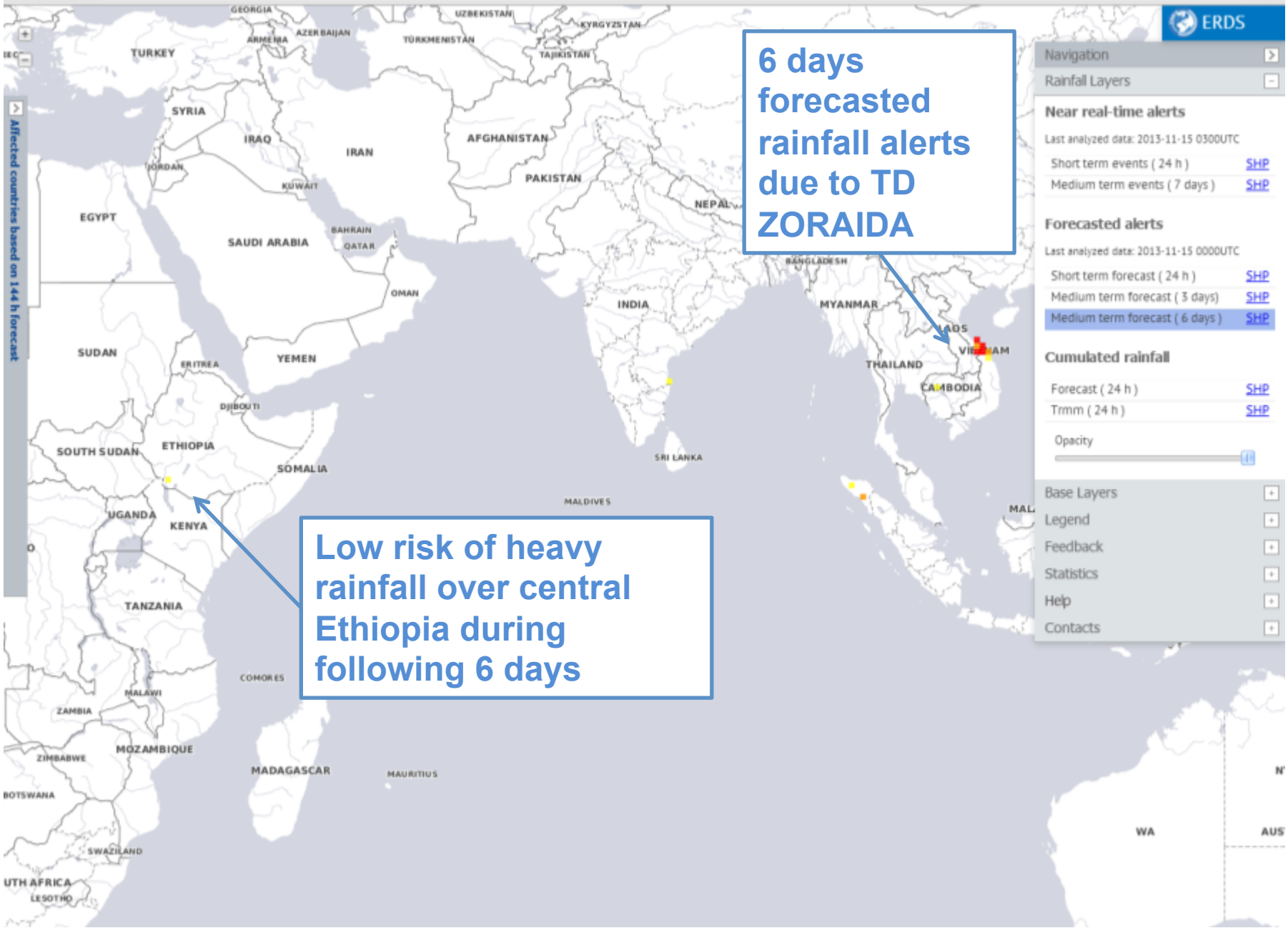
ERDS AS OF 15/11/2013

GFS 3 days forecasted rainfall alerts



ERDS AS OF 15/11/2013

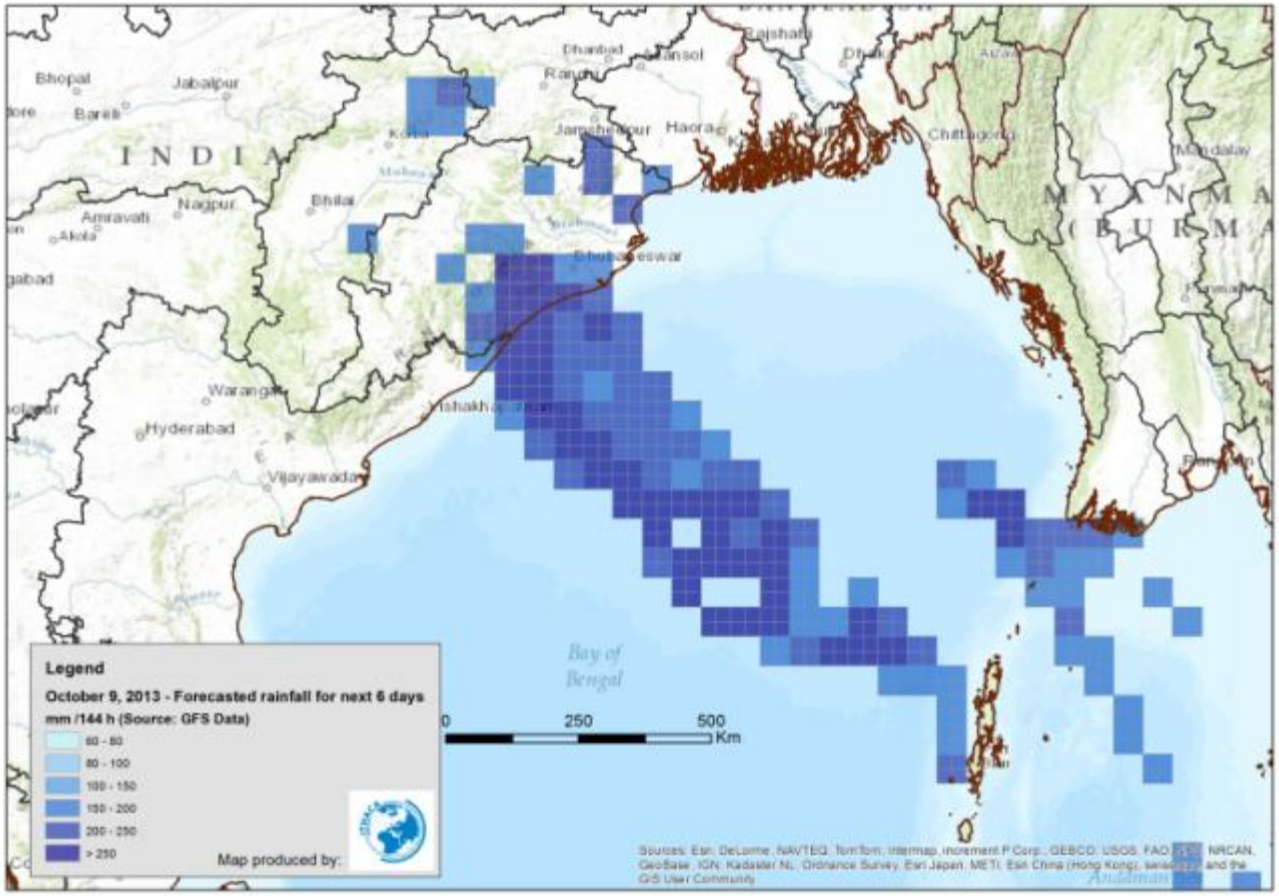
GFS 6 days forecasted rainfall alerts



4. Case studies

1. INDIA – Analysis of Cyclone PHAILIN (October 12, 2013)

October 9, 2013 GFS Forecasted accumulated rainfall for the next 6 days



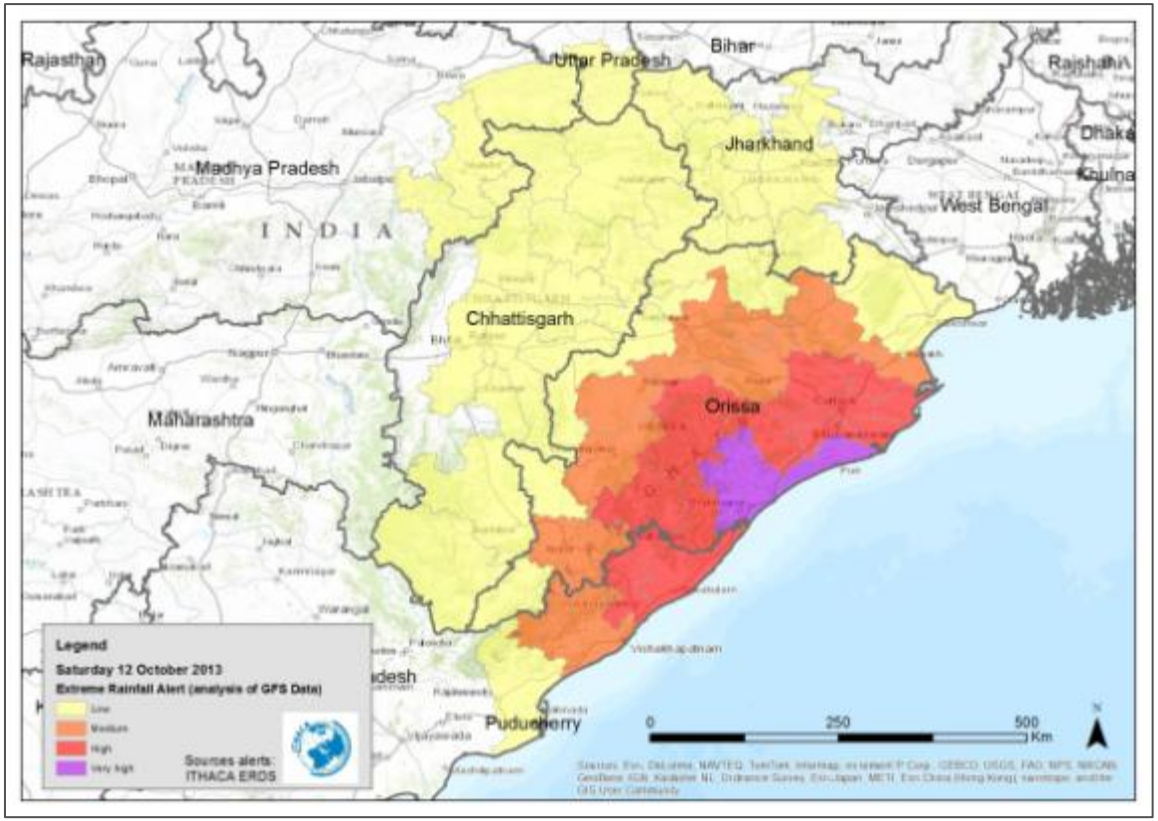
Following layers have been downloaded from ERDS web-site as shape-files:

-24h GFS forecast
-24h GFS alerts
-3 days GFS alerts
-6 days GFS alerts

1. INDIA – Analysis of Cyclone PHAILIN (October 12, 2013)

October 10, 2013 Alert map by administrative districts

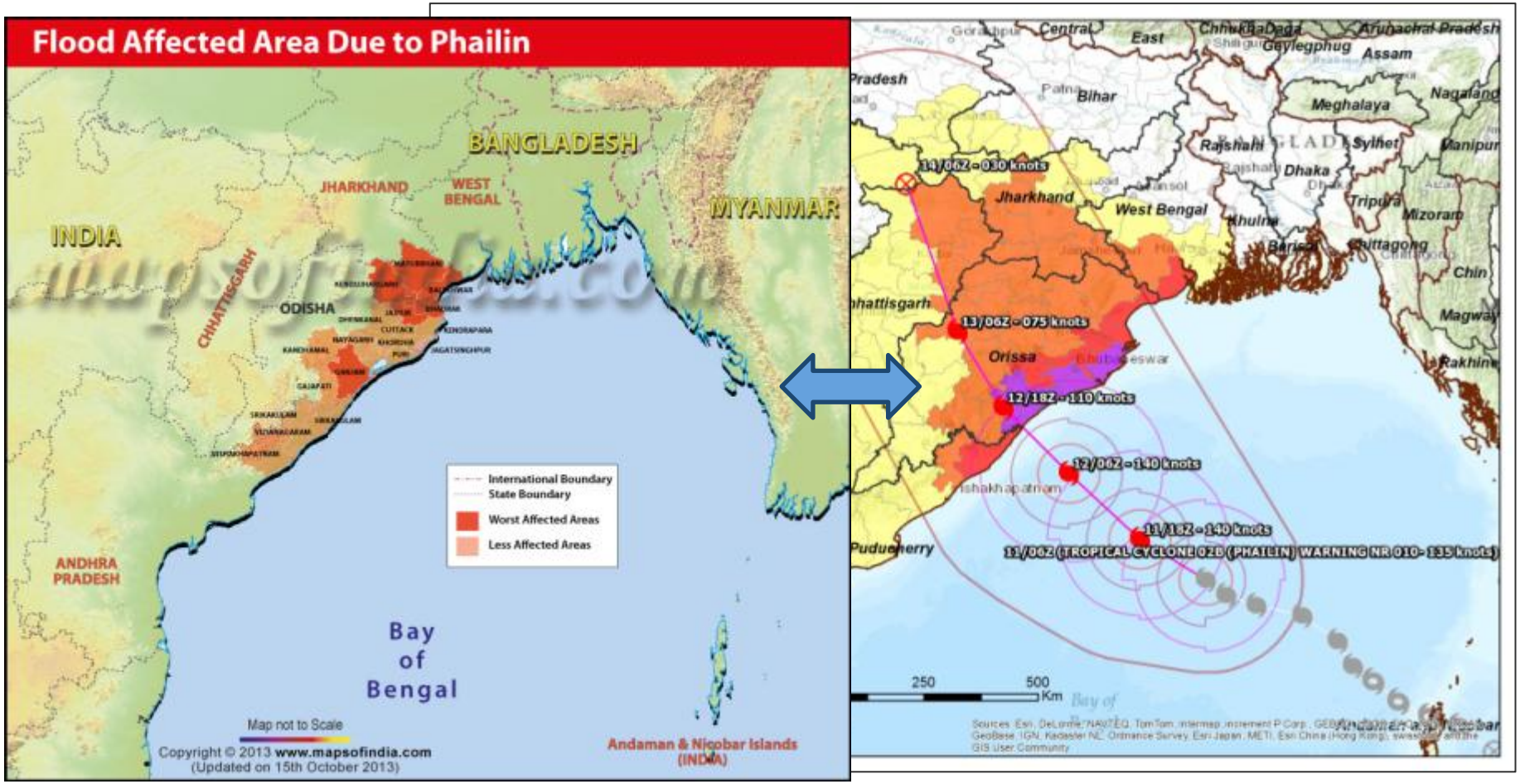
Making an INTERSECTION of downloaded shape-files with administrative districts layers a warning map has been produced and disseminated to end-users



1. INDIA – Analysis of Cyclone PHAILIN (October 12, 2013)

Post-event map

October 11, 2013
Alert on administrative districts + cyclone track



2. MOZAMBIQUE (14 - 23 January 2013)

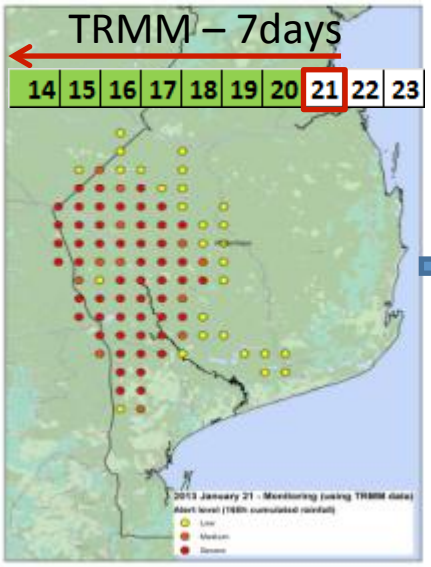
- ✓ Flood event: 14-23 January 2013
- ✓ Analysis of archived TRMM and GFS cumulated rainfall
- ✓ Aggregation of near-real time and forecasted rainfall over the same areas
- ✓ Effective alert dissemination using reference data-sets

2. MOZAMBIQUE (14 - 23 January 2013)

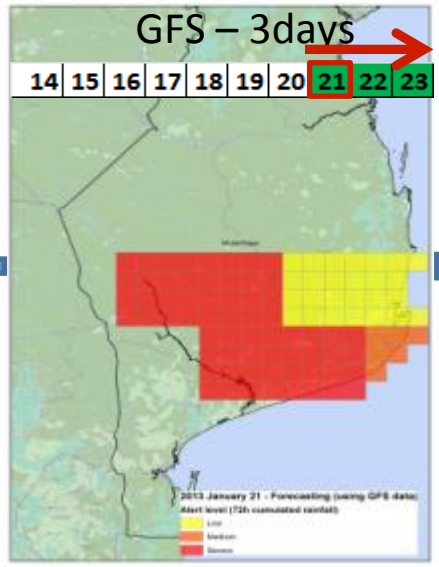
RAINFALL ANALYSIS AND FORECASTING (SITUATION AS OF 21 JANUARY 2013)

Aggregation of **near-real time** and **forecasted rainfall** over the same areas

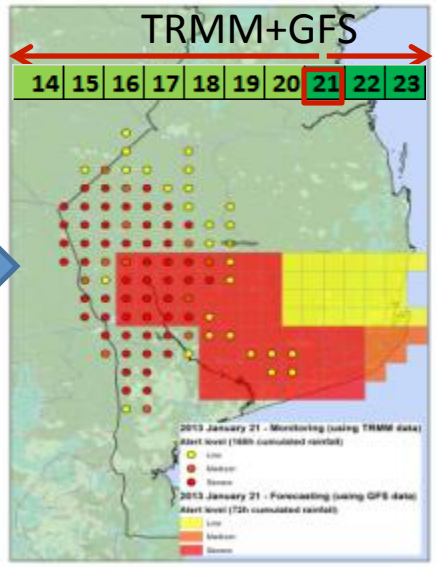
Near-real time alerts

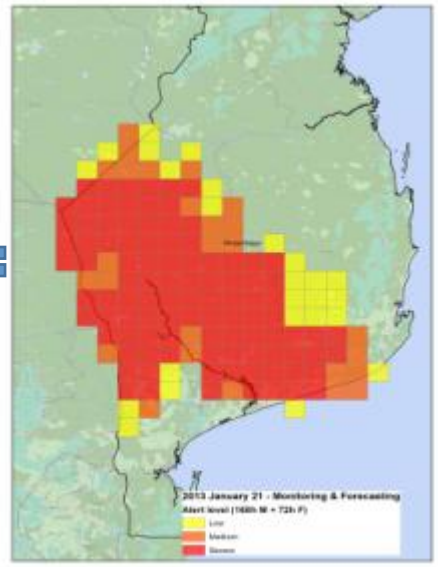


Forecasted alerts



Integration of alerts: **persistency of rainfall** assessment

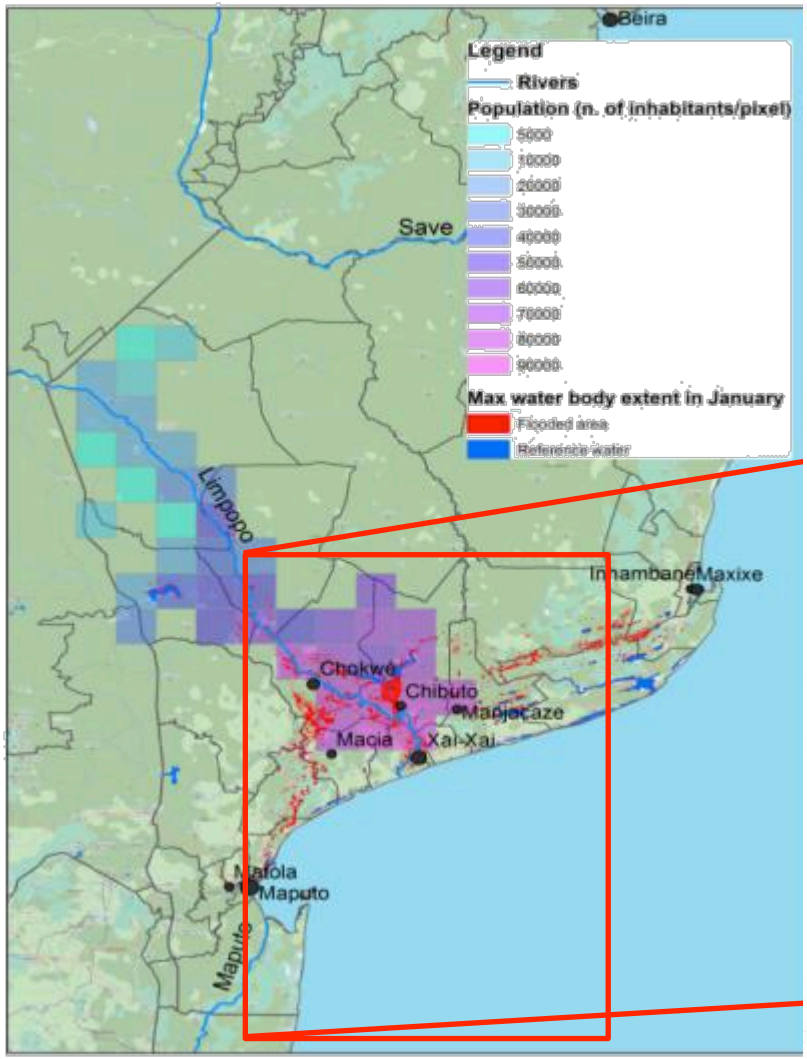


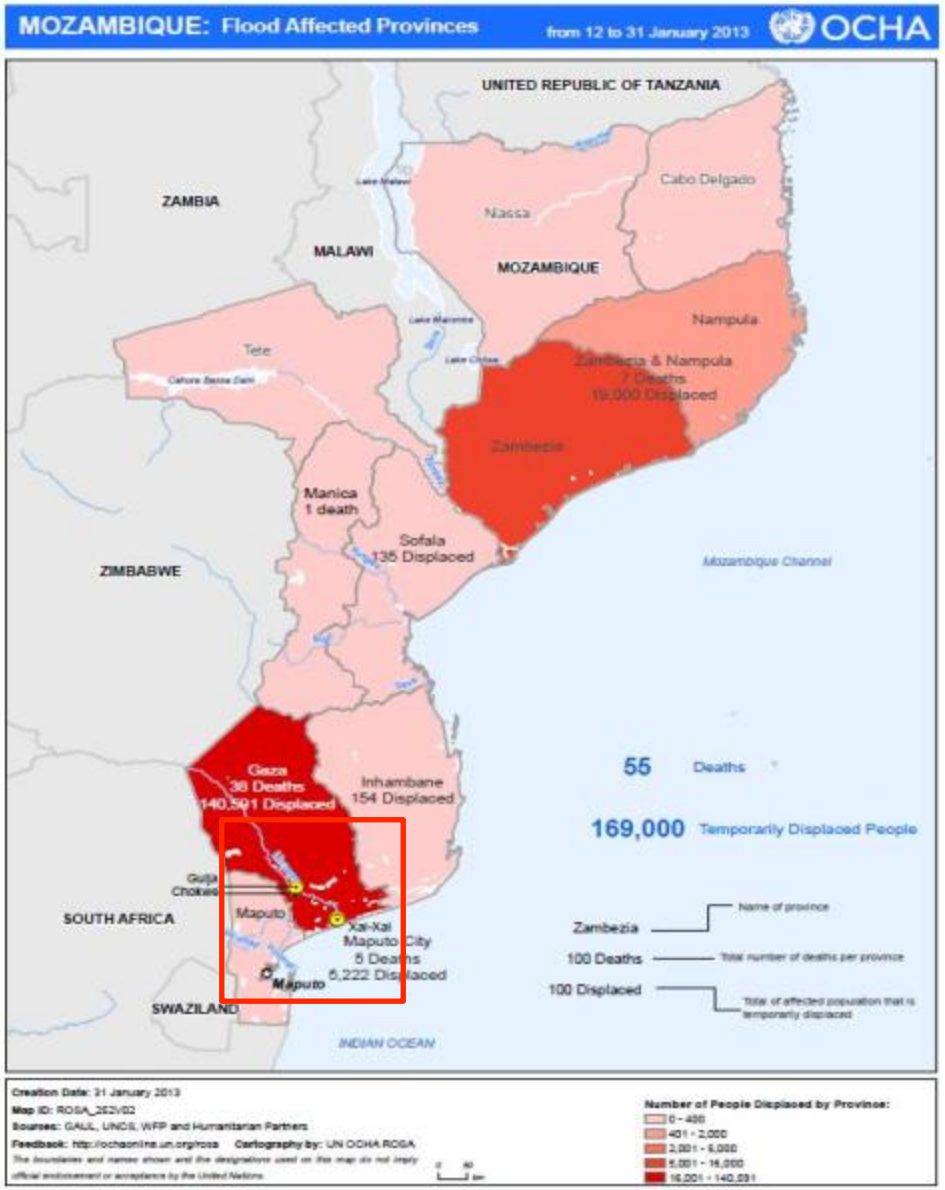


2. MOZAMBIQUE (14 - 23 January 2013)

MAGNITUDE AND VULNERABILITY ASSESSMENT

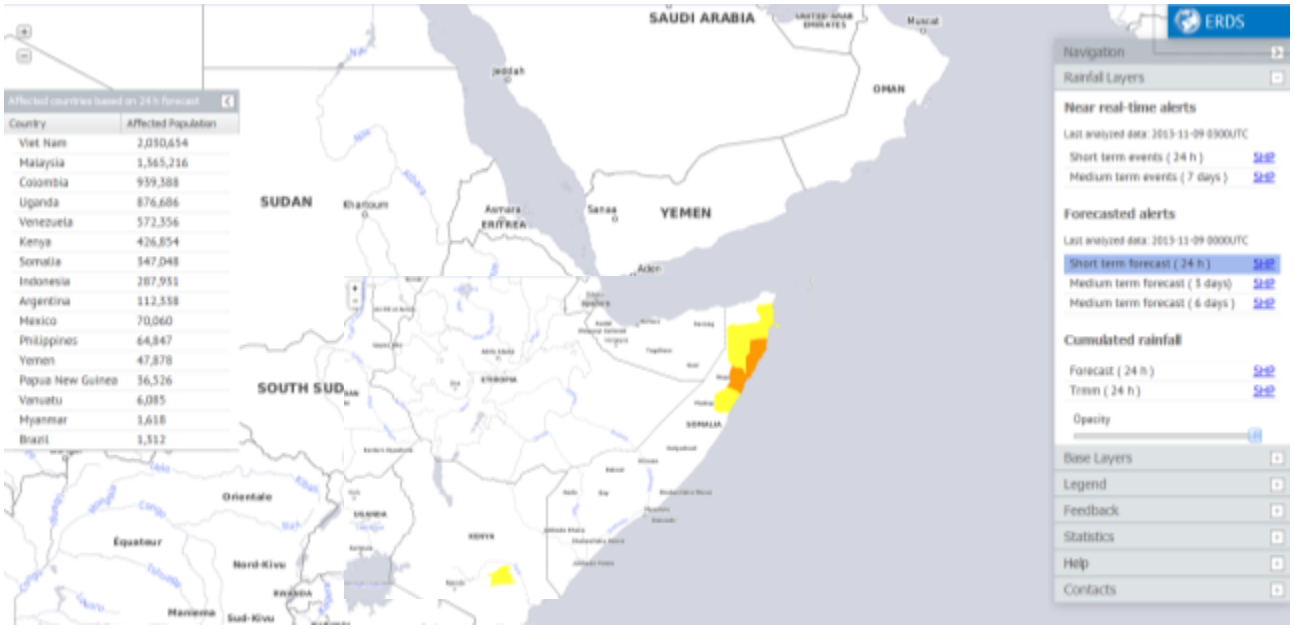
Providing analysis capabilities for the event magnitude a





3. SOMALIA – Analysis of Tropical Cyclone THREE

November 9, 2013
Alerts for the next 24h



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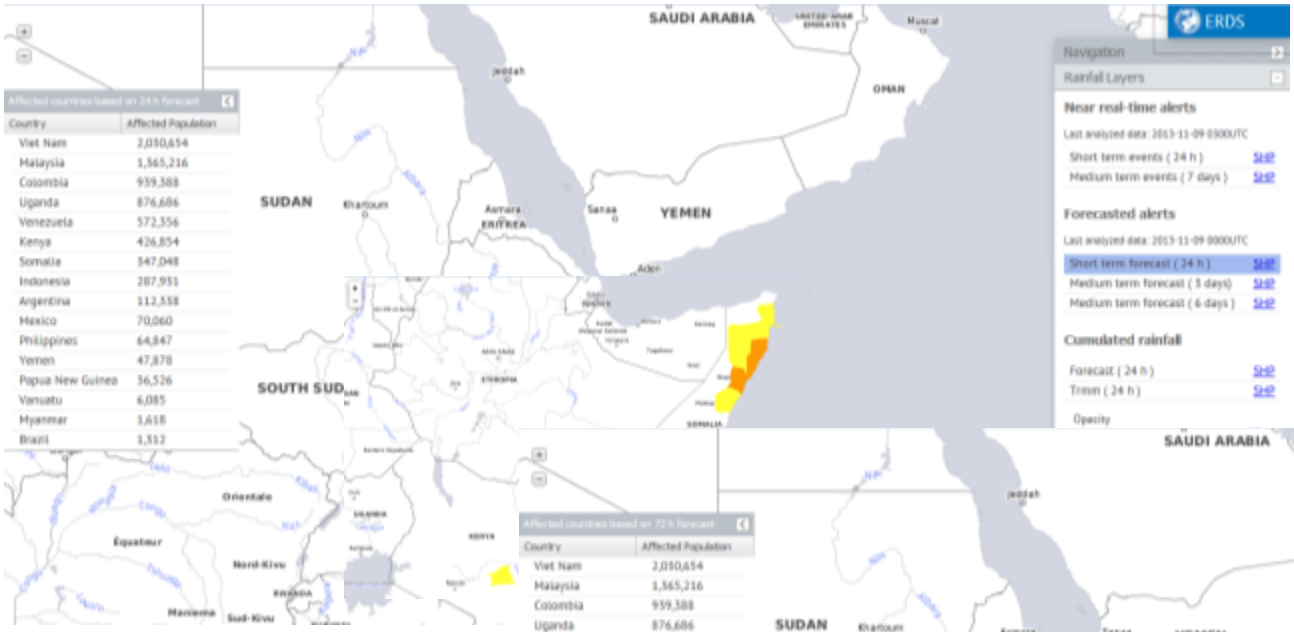
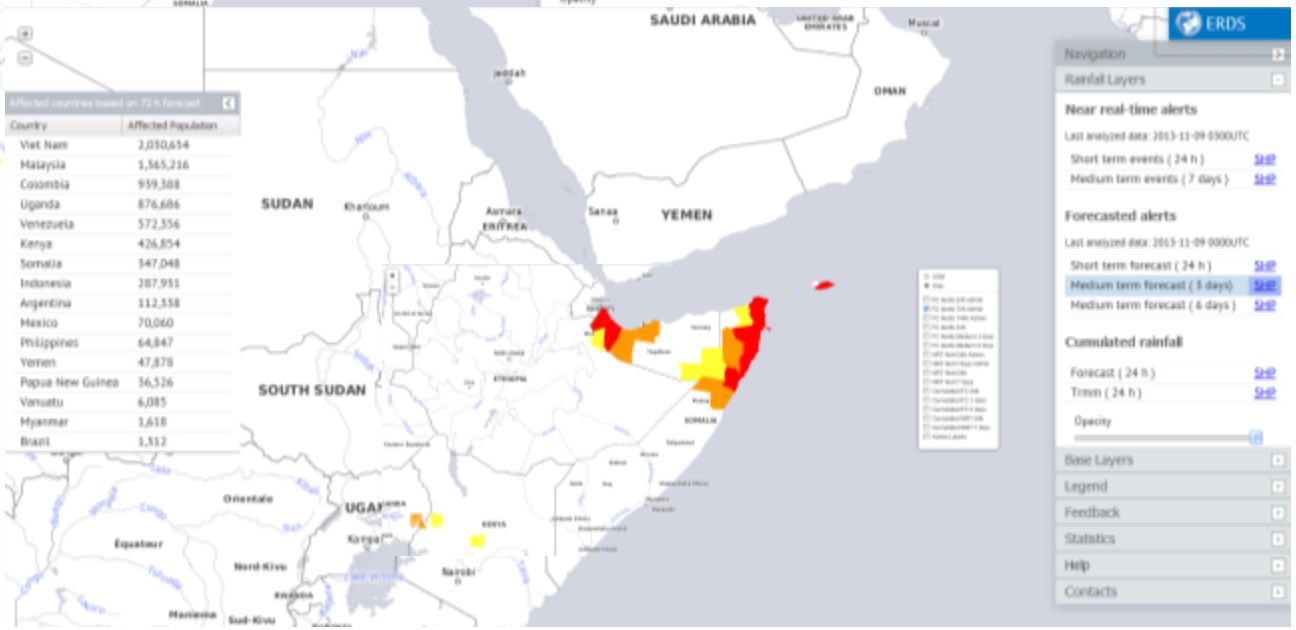


Alerts for next 3 days



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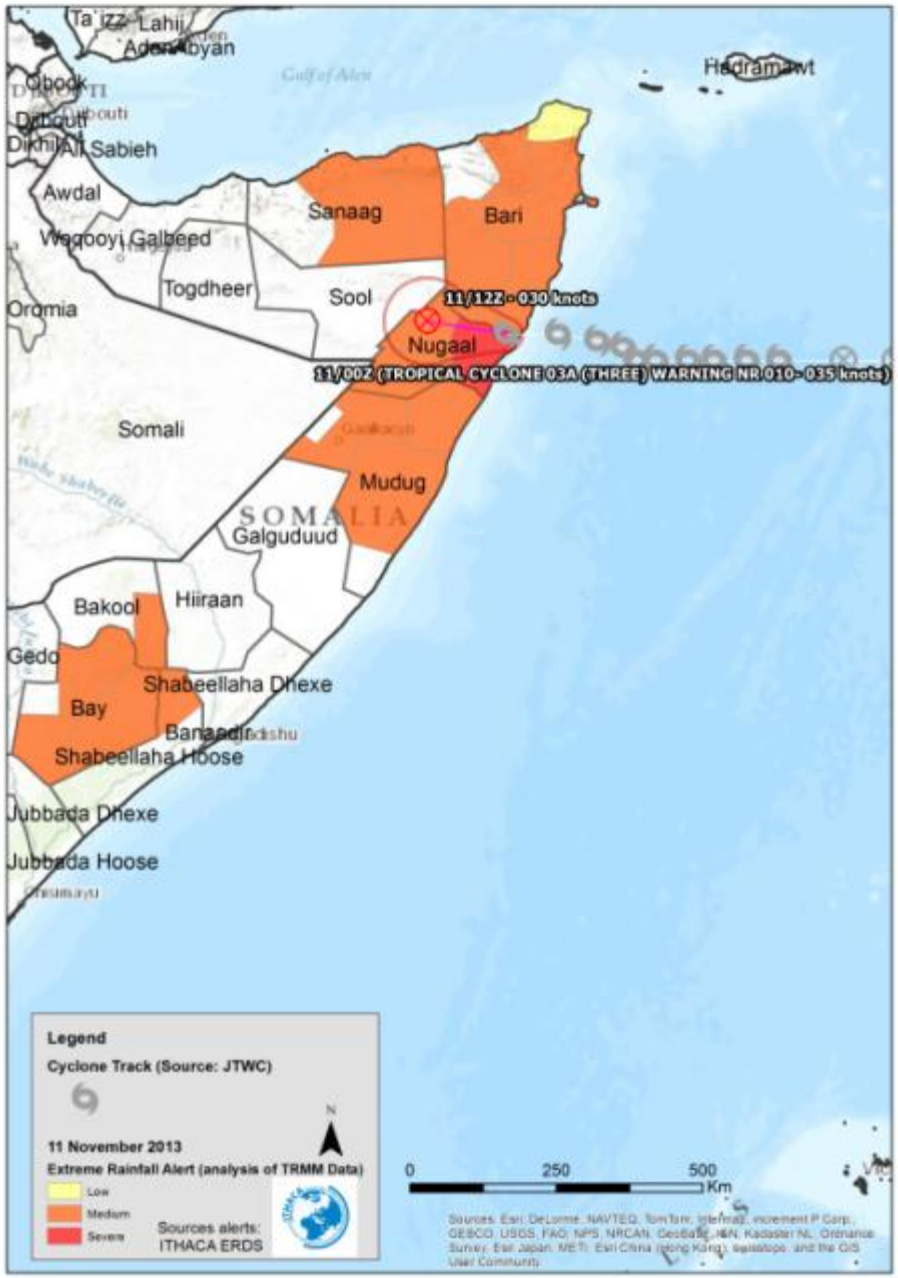

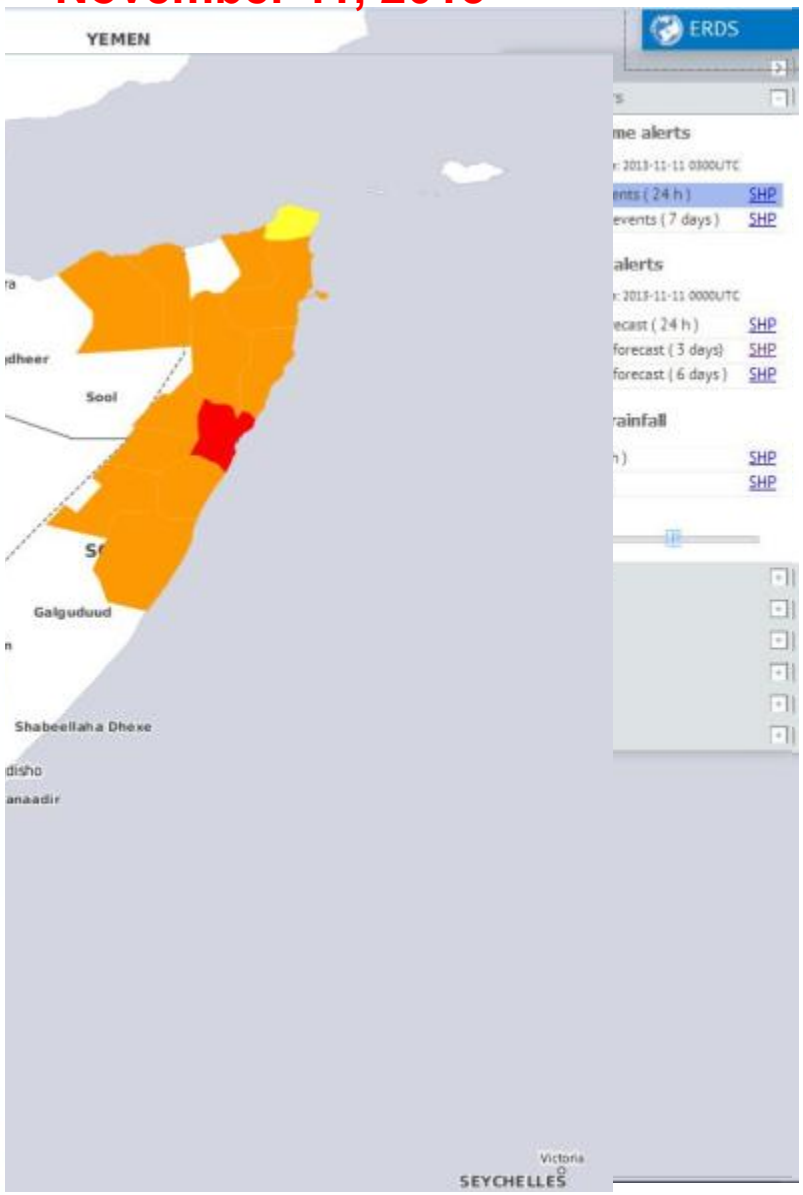

5. ERDS operational application

Thanks to ERDS further collaborators:

ERDS would not have been available without the help of:

Piero Boccardo – *ITHACA Director*

Simone Dalmasso – *ERDS development*

Paolo Pasquali *– ERDS front-end development*

Simone Balbo *- ERDS back-end development*

Eros Agosto *- ERDS back-end development*

Federico Cuatto *- ERDS development support*

Andrea Ajmar *– Database administrator*

Walther Camaro *– Data analyst*

… and thank you for your attention!

To contact the ITHACA Early Warning Team:
flood.alerts@ithacaweb.org

ERDS application:
http://erds2.ithacaweb.org/